North West Water

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17th October, 1977.

To: Members of the Lune, Wyre & Furness
Fisheries Advisory Committee
(Messrs. J. M. Croft (Chairman);
W. Bailey; R. Barratt; R. A. Challenor;
Major N. J. Clarkson Webb; Dr. J. V. Dyer;
J. H. Fell; A. L. Harris; L. Hill;
G. A. Martin; J. Taylor; G. Wilson; and
the Chairman of the Authority (P. J. Liddell);
(ex officio).

Dear Sir,

A meeting of the LUNE, WYRE AND FURNESS ADVISORY COMMITTEE will be held at 2.15 p.m. on MONDAY, 24TH OCTOBER, 1977, at the RED LION HOTEL, ARMATHWAITE, NEAR CARLISLE, for the consideration of the following business.

Yours faithfully,

G. W. SHAW,

Director of Administration.

A G E N D A

1. Appointment of Chairman.
2. Apologies for absence.
3. Minutes of the last meeting (previously circulated).
4. Fisheries Income and Expenditure (previously circulated).
5. River Leven - Discussion Paper.
6. Goosanders and Mergansers - Progress Report.
7. Fishery Limits Act, 1976 - Netting.
8. Fisheries in the Ownership of the Authority - Halton Fishery Progress Report.
9. Erosion.
10. Report by Area Fisheries Officer on Fisheries Activities.
11. Any other business.

NORTH WEST WATER AUTHORITY

LUNE WYRE & FURNESS
FISHERIES ADVISORY COMMITTEE

24TH OCTOBER, 1977

FISHERIES INCOME AND EXPENDITURE

1. Last February the Policy and Resources Committee were informed of the disappointing amount of income received from the sale of fishing licences in 1976, the first year of operation of the re-structured fishing licence duties. It was decided to seek an interim increase in licence duties of 30% to operate from 1st January, 1978, and set up a working party of officers to report on the general relationship between income and expenditure on Fisheries and make recommendations as to policy for the future. All Advisory Committees were informed of this decision at the March/April cycle of meetings.

2. Report of Working Party

After a critical examination of the expenditure charged to Fisheries Account, which identified certain areas and items where economies might be made, the general conclusion was that the expenditure reflected the standard of service provided. Only by drastically cutting the standard of service could expenditure be significantly reduced. It was not felt that this would be acceptable to the Authority in view of the short time the Regional Fisheries Services had been in existence. Rather than a cut in expenditure it was recommended that a cash limit be imposed on the future expenditure on Fisheries Account based on the £658,000 working expenses of the Rivers Division for 1977-78 plus an adjustment for future inflation. In addition, some attempt must be made to increase the income.

3. It was considered that income might be increased by restructuring and repricing fishing licences and levying fishery contributions if this proved feasible.

4. After reviewing the structure and operation of the present licences and taking account of the comments received from licence distributors and anglers, including the points raised by objectors to the proposed 30% increase, it was recommended that:-

(a) The present combined salmon/migratory trout licence be discontinued and replaced by a separate salmon licence and a combined migratory/non-migratory trout licence.

(b) Children of 10 years and over (instead of 14 at present) should hold licences.

(c) Seven day rod licences should be for 14 days and the duty increased.

(d) A scale of licences should be introduced to cover commercial eel fishing.

(e) The various licences and prices be as shown on Appendix I.

5. It was not proposed to seek increases in the Nets and Fixed Engine licences as these were substantially increased at the last review and the additional 30% would add considerably to the present unit figures as shown on Appendix II.

6. Water authorities may make application to the Minister of Agriculture, Fisheries and Food for an Order authorising them to levy a contribution on the owners of those fisheries where person(s) have the sole and exclusive right to the fishing. In order to do this, the fisheries have to be identified, a yearly value assessed, in a manner similar to that used for General Rating purposes, and a contribution, or rate in the £, is levied up to the amount specified in the Minister's Order. A good deal of work will be involved in setting up the records for levying such contributions and this is probably the main reason why only one authority, the Welsh, is proposing to extend the levying of contributions throughout their area. Nevertheless, in view of the urgent need to increase fisheries revenue from whatever source, it was recommended that further investigation be made into the feasibility of levying fishery contributions throughout the area.

7. The search for an acceptable rational relationship between income and expenditure is a topic being discussed by most water authorities. Some water authorities, e.g. Anglia and Thames, both of which have little or no game fishing, intend the fishery function to be financed 100% from revenue from licence duties. Other authorities are seeking a lower level of income from licence duties but seeking to charge what the market will bear. The problem is to find a rational base on which to decide policy. One suggestion, which has not found a great deal of support, was put forward by officers of the Northumbrian Authority, that licence income should provide only that income which would cover improvement to fisheries, the balance of expenditure being deemed to be of benefit to the general community being met by the community at large. It was estimated that this would result in licence revenue producing 30-35% of total expenditure of that Authority. Another suggestion by Severn-Trent is that licence income should meet the direct costs of fisheries and the balance be met by the community. Both proposals are subject to practical difficulties of identifying and analysing costs which would rest, in the ultimate, on subjective judgements.

8. The working party recommended as a practicable alternative that the long-term financial policy should be based on the principle that licence duties should, as a minimum, meet the costs of licensing and enforcement. The Authority is required by Statute, unless excused by the Minister as regards freshwater fish, to regulate fishing by means of a licensing system. It is absurd to have a system of licensing which does not pay for itself. The effect of applying this principle is that the cost of licensing and enforcement, based on the current year's estimates, is £400,000 or 56% of the total estimated cost of the Fisheries function of £710,000. If the 30% increase, due to come into effect from 1st January, 1978, produces £180,000, licence income will have to increase by a further 122% to attain the 56% level. It is suggested therefore that this large increase be phased in over three years starting in January, 1979.

9. It is to be noted that although the Authority has power to fix all other charges with reference only to the Price Commission, fishing licence duties have to be approved by the Minister of Agriculture, Fisheries and Food. In addition the procedure is lengthy, e.g. this report is concerned with the implementation of new duties with effect from 1st January 1979. If the proposals for phasing in the increases over three years are agreed, as soon as the Minister's approval for Phase 1 is received, an immediate start on the procedure to implement Phase 2 would have to be made. In particular this lengthy procedure does not facilitiate increases proposed to take account of inflation.

10. The report of the Working Party was submitted to the Finance and Personnel Sub-Committee on 13th September, 1977, and contained the following recommendations.

(a) Expenditure on Fisheries Account be contained for the immediate future by imposing a cash limit on expenditure, related to the £658,000 working expenses of the Rivers Division for 1977-78, plus an adjustment for future inflation.

(b) Restructuring and Repricing of Licence Duties:-

(i) The combined salmon and migratory trout licence be discontinued and be replaced by a separate salmon licence and a combined migratory/non-migratory trout licence.

(ii) The age at which a child must have a licence be reduced from the present 14 years to 10 years.

(iii) Seven day rod licences be for 14 days and the duty increased.

(iv) A scale of licences be introduced for commercial eel fishing.

(v) The various licences and prices from 1st January, 1979, be as shown in Appendix I.

(c) Further investigation be made into the feasibility of levying fishery contributions throughout the region.

(d) Income from licence duties as a minimum, meet the costs of licensing and enforcement.

(e) The proposed policy be phased over three years starting on 1st January, 1979, and licence fees should be increased in the two years thereafter with a view to income from licensing being sufficient to meet the costs of licensing and enforcement as from 1st January, 1981.

(f) If the above recommendations are approved, they be sent to the Regional and Local Fishery Advisory Committees for their comments and observations.

11. The Sub-Committee recommended approval of 10(a) but recommended that all the proposals in 10(b) be submitted to the Regional and Local Fisheries Committee for comments and observations before taking any further decision.

12. The views of all the Local Committees will be submitted to the Regional Committee on 14th November, 1977, whose recommendations will in turn be submitted to the Policy and Resources Committee on 5th December, 1977.

FISHING LICENCE DUTIES

Rod and Line (whole area)	Rates from 1st January 1976 £ p	Rates Increased by 30% wef. 1st January 1978 £ p	Proposed Structure and Rates wef. 1st January 1979 £ p
SALMON & MIGRATORY TROUT			**SALMON**
Season	12.00	15.60	Season 16.00
Part Season to May 31	6.00	7.80	Part Season to May 31 8.00
" " from June 1	7.00	9.00	" " from June 1 11.00
Junior/OAP's			Juniors/OAP's
Season	5.00	6.50	Season 7.00
Part Season to May 31	2.50	3.25	Part Season to May 31 3.50
" " from June 1	3.00	4.00	" " from June 1 5.00
7 day Licences	2.00	2.60	14 day Licences 4.00
NON MIGRATORY TROUT			**NON MIGRATORY TROUT**
Season	2.00	2.60	Season 4.00
Season Junior/OAP	1.00	1.25	Season Junior/OAP 2.00
7 day licence	.50	.65	14 day licence 1.00
FRESH WATER FISH & EELS			**FRESHWATER FISH & EELS**
Season	1.00	1.25	Season 2.00
Season Junior/OAP	.50	.65	Season Junior/OAP 1.00
7 day licence	.25	.35	14 day licence .50
In former Mersey & Weaver Area			**MIGRATORY & NON MIGRATORY TROUT**
Season	.50	.65	Season 8.00
Season Junior/OAP	.25	.35	Season Junior/OAP 4.00
			14 day licence 2.00
			COMMERCIAL EELS
			Fixed Eel Traps, 25.00 per trap p.a.
			Eel or Fyke nets 10.00 per net p.a.
			Traps, Putcheons or Baskets 5.00 per 25 (or part thereof) traps p.a.
Estimated Income	1977-78 £150,000	1978-79 £180,000	1979-80 £240,000

APPENDIX II

NETS AND FIXED ENGINES

LICENCE DUTIES

	Pre-1976 £	1.1.76 £	Proposed 1.1.78 £
Cumberland Area			
Whole Area Drift Net	35.00	60.00	78.00
River Eden Draw Net	60.00	150.00	195.00
River Esk Draw Net	30.00	50.00	65.00
Whole Area Heave Net	6.50	13.00	16.90
River Eden Coop	55.00	90.00	117.00
River Derwent Coop	125.00	200.00	260.00
South West Cumberland Garth ..	65.00	100.00	130.00
Lancashire Area			
River Ribble Drift Net	15.00	40.00	52.00
River Lune Drift Net	30.00	80.00	104.00
River Lune Draw Net	25.00	70.00	91.00
River Duddon Draw Net	20.00	55.00	71.50
River Lune Heave Net	15.00	30.00	39.00
River Kent Lave Net	15.00	30.00	39.00
River Leven Lave Net	15.00	25.00	32.50

APPENDIX 1

RIVER LEVEN - NOTES ON POSSIBLE REASONS FOR THE APPARENT DEPLETION OF FISH STOCK

Introduction

Up to the time of writing (5.9.77) the run of Migratory Fish has been very small - especially in numbers but also in size. The numbers of small (1/3 - 1/2 lb.) Brown Trout also seems to have diminished although the larger ones (3/4 - 2 lb.) appear to have been less affected. In recent years the run of Migratory Fish has also been disappointing - in common with many other rivers - but it is suggested that relatively the Leven has done worse than its neighbours.

The purpose of this paper is to examine possible causes for this state of affairs, with special reference to certain factors peculiar to the Leven, and to make suggestions for possible remedial action. It is appreciated that some of these may be regarded as controversial, others may be ruled out on economic grounds and some may prove to be impracticable. Nevertheless it is hoped to stimulate thought and discussion which may lead to action to try to improve what is rapidly becoming a serious state of affairs. Many of these points are not new but it seems appropriate to incorporate these with some new ones in one paper on this subject.

(1) The effect of UDN in earlier years

Prior to UDN occasional salmon entered the Leven in February and March, rather more in April and May and the main run came from mid June onwards - peaking in July and August. Large Sea Trout entered the river in May and June followed by big runs of smaller ones ("sprods") in July and August.

UDN appeared in the late autumn of 1966. In subsequent years this had the effect of virtually wiping out all Salmon which enter the river before the end of May. The run of these early fish has now almost disappeared.

From about mid June until Late September (or early October - depending on water temperature) very little disease is seen but it then reappears. Some fish - probably the later arrivals - survive to spawn. These probably breed late running fish and this would be in keeping with what seems to be happening. It would also seem to tally with what happened after the last outbreak of disease in the late 19th century. Referring again to History it seems likely that disease should now be on the wane but that it will be with us in diminishing form for several more years. It therefore seems probable that for a long time ahead we shall have few early summer fish and more back-end ones if nature is left to take its course.

Suggestion

Efforts should now be made to obtain 'Ova' from one or more rivers which have late Spring and early Summer runs and to introduce these (or ~~other~~ 'Fry') into the Leven system.

(2) The causes and probable effects of low river flow during the summer months

(i) Unusually dry summers in the Lake District

Long periods of dry weather accompanied by winds from between North and East have been common in this area during recent summers. For the time being at least this is outside man's control.

(Cont.)

(ii) The installation of an impervious weir at Newby Bridge

Since the installation of this weir river levels have quite often been lower than those seen previously. It is possible that the old Elizabethan weir leaked more than had been thought. In addition water flowed through the now demolished cut to the eel trap at the Old Mill and this certainly helped to keep up the river level when the lake was low.

(iii) The Abstraction of water from Windermere

This has obviously reduced the total amount of water going down the Leven. If pumping takes place during winter months when there is normally plenty of water little or no harm is done. Unfortunately, it is uneconomic to pump from Windermere except when the water is really needed which (subject to Minimum Flow restrictions) must often be in dry summer months. This use of the natural lake as an emergency reservoir inevitably leads to longer periods of low flow at times when the river's need is greatest. The residual 'water bank' of 500 million gallons may be enough to maintain fish life in times of extreme drought but is quite inadequate to produce any useful cleansing or scouring effect in the river.

Suggestion

Pumping operations should be so arranged during the winter months that the artificial reservoirs (Haweswater, Thirlmere etc.) are full by early April in order to restrict abstraction from the natural Lake to the absolute minimum during summer months.

(iv) Improved Land Drainage

Improved drainage for Agriculture and Forestry has speeded up the run off of water and therefore reduced the length of time during which a good river flow is maintained.

From the same sources come Nitrates from fertilisers which encourage weed growth. This apparently insoluble problem is one common to many rivers.

At this point it seems convenient to consider the adverse effects produced by prolonged low river flows. Even assuming that releases (when required) from the water bank will be sufficient to maintain fish life these are still serious as the following examples will show:-

(i) Silting-up in the tidal reaches of the river

This has assumed serious proportions leading at times to almost static and lake-like conditions there. Fish appear to be reluctant to leave this sanctuary to run up the river. This seems to fit in (on a small scale) with the theory that if a Barrage was built one of the problems arising might be a reluctance of migratory fish to leave the fresh water lagoon formed above the barrage and to proceed upstream until almost ready to spawn.

(Cont.)

It is known that Sea Trout and possibly some Salmon which remain in the Upper Tidal reaches actually spawn there under these conditions in preference to going up the river.

It seems certain that the ova deposited there gets covered with sand by big tides at times of low river flow and is thus destroyed and therefore wasted.

The purified effluent from the new Haverthwaite sewage works discharges only about 1/3 mile below the upper tidal limit. When there is little river flow this effluent presumably gradually concentrates in this area, increasing the Nitrates concentration and thus encouraging weed growth there. It is undeniable that unprecedented weed growth is now occurring in this area.

Another undesirable factor is that any concentration of fish in a relatively small and static area is an attraction for poachers.

Suggestion

The writer understands that certain Ports (e.g. Rangoon) have only been kept open by building concrete groins in positions where silting occurred in order to speed up river flow and thus scour out the deposits. Would it be possible for an expert in Hydraulics to examine the Leven estuary with a view to applying a similar (or any other) solution?

If and when the proposed Greenodd By Pass is built the effect (which may or may not be beneficial) on silting may be profound and should be very carefully considered.

(ii) The effect in the higher (non tidal) reaches of the river

The vulnerability of fish to Mergansers, Herons and Humans is increased.

Weed growth rapidly increases. Either this weed growth or some other factor seems to have reduced the previously abundant fly life. Rising trout are seen less frequently and Dry Fly fishing is less rewarding. Bottom feeding by trout on snails etc. may have increased but is there now an adequate supply of food suitable for Fry and Parr?

Suggestion

Whilst a continuing high level of nitrates from fertilisers and 'purified' sewage effluent seems inevitable, every effort should continue to be made to prevent the discharge of any raw sewage into the Lake, River and its tributary streams.

(3) The Absence of any very large floods down the river since the installation of the new weir and the flood release gates at Newby Bridge

Prior to the installation of these works there were occasional very large floods (of the order of 1500-2000 Mgd) down the river. These must have had a cleansing effect on the river and a scouring effect in the tidal reaches.

(Cont.)

Under these conditions the original weir completely disappeared and did not affect the Lake level - this being governed by the restricted flow through the arches of Newby Bridge.

Since the installation of the new Works it has been the practise to open the flood release gates when it was clear that a large flood was on its way down the Lake in time to avoid any risk of flooding the lake shores because of the increased height of the new weir. The writer believes that it is arguable whether the raising of the weir has in fact appreciably increased the risk of lake shore flooding. However the effect of the foregoing method of operation of the flood gates has been to limit peak flows down the river to a lower figure than previously - it is now rare to see flows in excess of 1000 Mgd.

Suggestion

That an experiment be carried out under carefully monitored conditions by delaying the opening of the flood release gates to enable a greater ultimate peak flow to build up down the river and to see whether this has the expected cleansing and scouring effect. Should the lake level rise faster or higher than expected the flood release gates would still be available for emergency use.

(4) The effect of the rapidly increasing Merganser population on the river

It is understood that Mergansers feed largely on fish. It is therefore possible (the writer believes probable) that they account for large numbers of Parr, Smolts and small Brown Trout.

For many months efforts have been in train to obtain a licence to shoot samples of these birds to enable stomach analysis to determine whether the damage to game fish life is appreciable. Progress in these negotiations has been negligible.

Suggestion

That every effort be made at the highest level to speed up the issue of these licences.

(5) Possible pollution of the estuary by industrial effluent

If poisonous substances are discharged here smolts proceeding to sea may be killed.

Suggestion

Routine and 'snap' sampling followed by appropriate action if required.

(6) All types of netting - at sea, in Morecambe Bay and in the estuary

Rumours abound but firm evidence is difficult to obtain.

Suggestions

(i) A thorough review of existing safeguards with a view to strengthening these if necessary.

(Cont.)

(ii) 'Snap' visits by Inspectors to Ports and Villages where Salmon and Sea Trout may be landed.

(iii) Continuing efforts to outlaw the use of Monofilament nets.

(7) Poaching

This is an increasingly difficult problem because of organised professional gangs who are not averse to the use of violence.

Suggestions

(i) Basically the provision of more Bailiffs with the best possible communications equipment.

(ii) More Honorary Bailiffs (if suitable ones can be recruited) to accompany regular bailiffs on their rounds.

(iii) Flexible working hours - even if shift allowance and/or overtime payments may be required.

(iv) The use of dogs (even small ones if properly trained) to give warning of the presence of strangers, and minimise the risk of unexpected attack.

(v) Continuing pressure on Government to introduce legislation banning the sale of Migratory Fish to other than Licenced Dealers.

In Conclusion

During the Spring, Summer and early Autumn of 1977 there have been on several occasions adequate river flows to bring in Migratory Fish from the estuary and to enable them to run up the river. Despite this welcome change from recent years they have not come in appreciable numbers. Presumably this means either:-

(i) They were not there to come. This could be because of lack of spawning fish in earlier years; destruction of Ova, Fry, Parr and Smolts and/or some catastrophe or netting whilst at sea.

OR

(ii) They failed to get from the sea into the river. This could be because of netting in one form or another in the estuary or tidal reaches of the river or, possibly, because of the very severe silting up of the estuary.

It now remains to be determined what action can be taken to improve matters for the future.

J.H. Fell.

OFFICERS COMMENTS ON PAPER BY MR. J. H. FELL ON POSSIBLE REASONS FOR DEPLETION OF FISH STOCKS IN THE RIVER LEVEN

(Headings relate to the relevant paragraphs in Mr. Fell's paper)

Introduction

It is, perhaps, arguable whether the Leven has, in fact, fared worse than neighbouring rivers in recent years, so far as runs of migratory fish are concerned. There has been a general trend, in common with nearly every migratory fish river in Britain, towards later and later runs, and towards an increased grilse component in the stocks. In 1977 the runs have been two to three weeks later than in previous years, and the Leven has been later even than neighbouring rivers. Since Mr. Fell's paper was written, the reported rod catch of salmon on the Leven has improved substantially. Nevertheless it is worth noting that during 1977 the river changed its course upstream of Plumpton railway viaduct and, as a result, scoured out the channel through the centre arch, thus draining off, the pool which had, for many years, existed upstream of the viaduct, and in which numerous migratory fish formerly accumulated. Netsmen have observed that numbers of salmon and sea trout have been dropping back, further downstream, on the ebb, long before the tide had receded far enough for netsmen to get near them. It has been suggested that the elimination of the pool at Plumpton may have discouraged ascending fish from penetrating further upstream. While this view is necessarily conjectural, there is a parallel in the situation which existed on the Duddon below Duddon Bridge several years ago, after channel 'improvement' had eliminated holding pools in the tidal length. There, too, fish refused to go on up river, and dropped back seaward on the ebb tide.

Reduced runs on the Leven may be connected with two factors - the severe incidence of Ulcerative Dermal Necrosis in previous years, coupled with the very small spawning areas which support stocks in this river system. One might think that the catchment feeding Windermere Lake offered almost unlimited spawning, but in fact migratory fish confine themselves to two tributaries only - the small Miller Beck and Troutbeck. In the latter beck there is severe competition from the large brown trout of the Lake, not only for spawning grounds, but for feed for the young fish, with the trout having the advantage of hatching first. The apparently obvious solution of carrying out heavy stocking with hatchery fry on the Brathay/Rothay system at the head of the Lake, and in waters further upstream in the catchment is negatived by the very low biological productivity of these waters which would be quite incapable of supporting the numbers of young migratory fish which would be required. The result of these very limited spawning areas may well have been drastically to slow down the building up of stocks of migratory fish after the impact of UDN. The surprising thing, from a fisheries point of view, is that stocks have been maintained at all in these conditions.

Paragraph 1 - Spring Fish

Mention has been made above of the trend towards later and later runs in most of the rivers in Britain where migratory fish occur. Such a trend (and the reverse of it) has been recorded around the end of the last century and early this century, and appears to be the result of a natural cycle of variation. There is no evidence to show that the use of ova from spring-running fish (even if they were obtainable in the prevailing circumstances) will generate stocks of adult fish with spring-running characteristics. Indeed the Ministry of Agriculture, Fisheries and Food has urged the use of ova from local fish only on the basis that, over many thousands of years these fish have become particularly adapted to the peculiar requirements of their own river. In another fifty or sixty years' time the cycle of runs may have begun to change again.

Paragraph 2(ii) - Newby Bridge Weir

The new weir was constructed as part of the works carried out under the Manchester Water Order, 1966. The Order was not made until after a Public Inquiry had been held, and one outcome of this Inquiry was acceptance that some 'injurious affection' might result to fisheries and, to offset this possibility, provision for payment by Manchester Corporation of compensation amounting to £30,000 was made, to offset this 'injurious affection' to fisheries on the River Leven, the money being used for the 'improvement of fisheries' as required by Section 20 of the Order. The amount of compensation payable was assessed on the basis of a programme of fisheries works prepared at the time. This programme was critically reviewed by the officers, in collaboration with a sub-Committee of this Committee and a revised scheme of works was presented to the Committee for approval. The proposals were, however, rejected in favour of an alternative proposal by a member of the Committee, which has, after prolonged negotiation, been implented. On the basis of information so far available, this has resulted in considerable benefit to fisheries. It is thus fair to say that the compensation paid to cover 'injurious affection' to fisheries on the Leven has been applied strictly in accordance with the advice and wishes to this Advisory Committee. To reopen discussion of alleged damage to fisheries attributed to works carried out under the Order, for which compensation has been paid, would thus appear to be pointless.

Paragraph 2(iii) - Abstraction of water from Windermere

Pumping operations to abstract water from the Lake are closely linked to the availability of supplies from all the other sources within the overall supply system, and are governed by an 'operating rule curve' which takes account of all factors affecting supply from the complex network which exists, and which must be strictly observed if the maximum economic yield is to be obtained from the whole system. Windermere is in no sense an 'emergency reservoir'; like Ullswater it is part of the overall system, to be used only when it can most advantageously be drawn upon in accordance with the 'operating rule curve'. Like Ullswater, abstraction from Windermere is strictly controlled by the terms of the abstraction licence, which lays down residual flows in the River Leven, below which abstraction may not take place. The flow for summer is double that for winter, thus creating a favourable bias towards winter abstraction. It is, perhaps, worth mentioning that the

average daily flow in the Leven is 1,186.9 Ml and that the annual total abstractions made from the Lake during the past six years are as follows:-

1972	(pump testing only) ..	124.5 Ml
1973	.. ..	2,375.5 Ml
1974	.. ..	7,729.8 Ml
1975	.. ..	4,091.1 Ml
1976	.. ..	30,272.2 Ml
1977	(to 4th October)	2,186.3 Ml

In relation to the average daily flow, abstractions of this order are clearly negligible. The largest total annual abstraction in 1976 was made principally during the exceptionally wet period which occurred in September to December, with a view to giving Thirlmere and Haweswater every opportunity to refill as quickly as possible, an aim which is fully in line with Mr. Fell's suggestion.

The 'water bank' of 500 mg provided in Winderemere for fisheries purposes was never envisaged as a means of providing scour to remove silt from the lower river. Its intention was to provide additional water in the river during periods of drought, if required as a result of fish being in difficulties. This purpose it has satisfactorily achieved on several occasions. Indeed, in 1976 when the water level at Newby Bridge Weir fell below the level of the weir crest, it was only a discharge from the 'water bank' through the special fishery sluice which enabled a survival flow to be maintained at all in the river.

Paragraph 2(iv)(i) - Silting-up in the tidal reaches of the river

The Area Engineer, who has known the Leven for more than 30 years, is of the opinion that, allowing for seasonal variations, conditions generally on the tidal length have not altered significantly during that period, although they have afforded an endless source of discussion, conjecture and suggestion. The suggested construction of concrete groynes, apart from the immense cost of such a project, would be likely to be ineffective as a means of keeping the channel clear, because it is not considered practicable to design a groyne which could achieve this regardless of the direction of flow of the tide. (It is presumed that if this system works at Rangoon, the port may be upstream of the tidal limit.)

It would certainly be possible to obtain the services of a Consultant Hydraulics Engineer to examine the Leven estuary. However, with the possibility of development of a major water resources scheme, in that area, in addition to the construction of the Greenodd by-pass, it seems questionable whether, at this stage, a consultant could come to any worthwhile conclusions. The Authority engineers have studied the plans for the by-pass, as have the fisheries staff, and certain amendments in the interests of fisheries have been proposed. It does not appear from the plans and proposals submitted that the work is likely to result in any major problems.

On the question of the effect of impoundments upon the upstream movement of migratory fish, Mr. Fell may be correct. There is, however, an approximate analogy on the Lune, where there is the large and deep impoundment behind Skerton Weir, just at the head of tidal water, and, a mile or so further upstream a similar impoundment behind Forge Weir. Fish certainly accumulate in large numbers in these impoundments, but, given suitable running conditions, they do not display any notable reluctance to proceed upstream.

With regard to the effluent from Haverthwaite STW, so long as water flows down the river, and so long as the tides flow and ebb, there will be dilution and mixing of the effluent, and there will be a general flow out to seaward which jointly should help to prevent any continuing build-up of effluent in the river in the vicinity of the outfall. The works are quite new and have a consent requiring a 30/20 suspended solids/BOD discharge. Samples taken show that these standards have generally been met, with some variations due to settling down of the filters. The works is operating well within designed capacity. The effluent produces no effect upon river quality which is Class I above and below the outfall.

There are no known discharges of crude sewage into the Lake (where byelaws now control discharges from boats) or into the non-tidal river.

Paragraph 2(iv)(ii) - The effect in the non-tidal reaches of the river

Increase in weed growth would not normally be expected to result in a decline in fly life - rather the reverse, as witness the position on chalk streams. There might be some reduction locally in species of insect whose larvae prefer a bare shingle bottom, but this should be offset by an increase in species with weed-living larvae. From earlier comments in Mr. Fell's paper, the river already appears to support a stock of fairly large trout. Lack of smaller fish might be associated with spawning problems in recent years (e.g. spawning in small becks which had dried up in the summer and in which invertebrate life had not subsequently had time to regenerate; thus no food for the young fish).

Paragraph 3 - Absence of large floods

Records for the period since 1971, when the impermeable weir and flood sluices were constructed at Newby Bridge, show that floods in excess of 1,000 mgd occurred on four days in December, 1972, did not occur at all in 1973, occurred on seven days in December, 1974, on nine days in January/February, 1975, and again did not occur at all in 1976. The largest individual flood recorded was one with a mean flow of 1,273 mgd on 27th January, 1975. In considering the occurrence of large floods from a historic aspect, it should not be forgotten that while the 1960's were generally a particularly wet period, the 1970's have been substantially drier. There would thus be a tendency for flows generally to be lower and for large floods to be absent.

In tidal waters the bulk of any scouring which takes place is usually attributable to the effect of big spring tides rather than to freshwater flow.

Paragraph 4 - Mergansers

This matter is covered in Agenda Item No. 6.

Paragraph 5 - Industrial pollution of the estuary

Tank-stored crude sewage is released from both Greenodd and Ulverston on the ebb tide. In addition there is an industrial discharge at Ulverston which is under regular surveillance by the Authority. At present, insufficient detailed information is available about the effect (if any) of these discharges upon fish life in the vicinity, for any comment to be made upon the suggestion by Mr. Fell. It may, however, be significant that there have been no reports of fish kills in that area.

Paragraph 6 - All types of netting

Mr. Fell has hit on the nub of the problem in this field - namely that rumours abound but firm evidence is difficult to obtain. The reason for this is that, while knowledge of netting activities within, for example, the Lune estuary is normally available, the lack of a suitable boat has precluded any possibility of putting to sea quickly to investigate reports of illegal activity offshore. A small, fast boat is to be obtained in order that investigations of this type can be undertaken and sea trials have already taken place.

It is believed that the major impact of netting is likely to occur off the Irish coast. A recent report has referred to a new net fishery opened up this summer off Cork which is reported to have admitted to taking some 72,000 salmon - which probably means considerably more in fact. It seems likely that a proportion of this catch would have consisted of fish destined for rivers on the west coast of Britain. Even rumour has not suggested that any activities on a scale remotely comparable with this have been taking place in Morecambe Bay. Enquiries were instigated after the last meeting of the Committee, through the Lancashire & Western Sea Fisheries Committee, about landings of salmon at ports within their area, or even rumours of such landings, but information has been negative. Our own Fisheries Inspectors are also on the alert for information about anything of this kind, and there has been no indication that illegal landings have been taking place.

With regard to monofilament netting, the use of any net made wholly or partly of this material is prohibited under the Authority's Fishery Byelaw No. 8(vi).

Paragraph 7 - Poaching

Mr. Fell's suggestions are perfectly reasonable, though the implementation does present problems.

(i) One of the most difficult things at present is to obtain any extra staff. The heavy debit balance on Fisheries Account has already resulted in a proposal to 'freeze' fisheries revenue expenditure except for inflation, and in these circumstances there can be no possibility of obtaining extra bailiffs. As regards communications, radio equipment has been introduced since the Authority was formed, and has adequate range and power. With the development of a Regional Communications Network, it may, in due course, be possible to obtain improved communication with smaller, lighter sets, but this possibility is still some way ahead.

(ii) Experience has shown that Honorary Bailiffs, while ready to assist with such matters as licence checks, are often reluctant to undertake duties involving an element of risk. Being honorary they cannot, of course, be compelled to do so.

(iii) Despite the new 37 hour, 5 day week, bailiffs do not work a standard 9.00 a.m. to 5.00 p.m. day, their hours being put in to suit local requirements of the job. Payment of overtime on an annual basis, in relation to the sum of their 37 hour weeks, has already been agreed.

(iv) The use of a dog and handler has been approved, these being supplied by a security firm. Unfortunately, while this firm is reasonably close to the poaching area of West Cumbria, it is rather far from this Committee's area to enable it to be used with equal readiness. The use of private dogs is discouraged by the Authority on account of the legal complications which could arise if the dog (even a small one) were to bite anyone. Otherwise their use could well help to give warning of unanticipated attack.

(v) Progress is being made in the matter of proposals for licensing of salmon dealers. A Working Party of Fisheries Officers which met at NWC on 30th September agreed to put forward certain recommendations to the NWC for consideration by their Fisheries Committee at its next meeting on 12th October. If these recommendations are approved by the Committee and subsequently confirmed by NWC, further progress will depend upon their acceptance by MAFF, and the possibility of drafting appropriate legislation and getting it into the legislative programme.

Item No. 5

NORTH WEST WATER AUTHORITY

LUNE, WYRE AND FURNESS LOCAL FISHERIES ADVISORY COMMITTEE

24TH OCTOBER, 1977

RIVER LEVEN DISCUSSION PAPER

POSSIBLE REASONS FOR THE APPARENT DEPLETION OF FISH STOCKS

1. Mr. J.H. Fell has prepared a Paper for discussion on the possible reasons for the apparent depletion of fish stock in the River Leven. A verbatim copy of the paper is attached at Appendix 1.

2. The general observations of the officers on the Paper are attached at Appendix 2 but certain of the points raised in Mr. Fell's Paper appear as specific items on the agenda.

NORTH WEST WATER AUTHORITY

LUNE, WYRE AND FURNESS
FISHERIES ADVISORY COMMITTEE

24TH OCTOBER, 1977

GOOSANDERS AND MERGANSERS - PROGRESS REPORT

1. This matter was first raised at the meeting of this Committee on 17th January, 1977, (Minute No. 21) when the Regional Fisheries Officer was asked to prepare for the next meeting of the Committee a full report on the present state of scientific knowledge of the feeding habits of these birds, and the consequent effect upon fisheries.

2. Accordingly a report was submitted to the Committee on 4th April, 1977 (Minute No. 27) when the Regional Fisheries Officer was then asked to enquire of the Ministry of Agriculture, Fisheries and Food into the possibility of interested Angling Associations obtaining a special licence to kill these birds for scientific purposes. It was envisaged that members of the Associations would shoot the birds, and that scientific officers of the Authority would examine and report upon their stomach contents, with a view to discovering the extent to which these birds on the Lune and Leven were preying upon salmonid stocks.

3. The Regional Fisheries Officer wrote appropriately to the Ministry on 20th April, 1977, and on 13th July, 1977, the DOE (who are now responsible for the issue of licences) indicated in reply, in a rather guarded manner, that they took the view that an authorised person would not be committing a statutory offence by shooting birds to prevent serious damage to salmon or trout but added that the Secretary of State had no power to interpret the law which was a matter for the courts.

4. The application forms for licences sent by the Department were forwarded to the Chairman of the Committee forthwith and on 5th August, the completed forms were sent off to the DOE with a covering letter.

5. Nothing further had been heard by mid-September when a telephone call was made to the DOE in an effort to expedite a reply. An assurance was received that this would be forthcoming shortly, and on 26th September the Regional Fisheries Officer received from the Department copies of replies which had been addressed to Messrs. D. While and R. A. Challenor. These stated that it had been decided, after consultation with the Advisory Committee on the Protection of Birds for England & Wales, not to issue licences. It was stated, in explanation, that neither species could be considered to have a large population in Britain and that the killing of 50 birds on the rivers in question would be likely to have a serious effect on the small populations in the locality. It was further suggested that the applicants might study the published literature on the subject of the feeding habits of these birds, which in fact, the Regional Fisheries Officer had drawn heavily upon in preparing his original report for the Committee. It was also suggested that consideration should be given to published information on the stomach contents of birds legally shot in Scotland.

6. As the Regional Fisheries Officer was acting, in the first instance, merely as a go-between in preliminary negotiations with the DOE, it is considered that in view of the Departments unfavourable reply, should the Associations wish to pursue the matter further, they should themselves contact the DOE.

7. In paragraph 4 of his paper on the depletion of fish stocks in the River Leven, which has been reported to the Committee under Agenda Item No. 5, Mr. Fell states that "progress in these negotiations has been negligible". It is hoped that the foregoing account will clarify the position and explain what has taken place since April.

Item No. 7

NORTH WEST WATER AUTHORITY

LUNE, WYRE AND FURNESS
FISHERIES ADVISORY COMMITTEE

24TH OCTOBER, 1977

FISHERY LIMITS ACT, 1976 - NETTING

1. A Member has requested a report and presentation on the present position regarding net licences which are allocated under the Net Limitation Orders applicable in the area of the Advisory Committee.

2. A presentation will be given at the meeting but for the information of members the net licences which are now allowable under the existing Orders are as follows:-

Estuary	No. of Nets	Type of Net	Licence Duty £	Specified Area
Wyre	In suspense	Heave or Haaf	7.50	The Wyre Estuary seaward of Shard Bridge
Lune	46	Heave or Haaf	30.00	The Lune Estuary seaward of Carlisle Bridge, Lancaster
Lune	3	Draw, Draft or Seine	70.00	The Lune Estuary seaward of a line drawn true south-east from the landward side of the breakwater at Brazil Point.
Lune	12	Drift, Hang or Whammel	80.00	The Lune Estuary seaward of a line drawn from Cockersand Abbey Lighthouse to the seaward extremity at high water of Sunderland Point up to the six mile limit.
Kent	8	Lave	30.00	The Kent Estuary seaward of a line drawn parallel to and 400 yards below Arnside Viaduct
Leven	6	Lave	25.00	The Leven Estuary seaward of a line drawn parallel to and 400 yards below Ulverston Viaduct
Duddon	3	Draw, Draft or Seine	55.00	The Duddon Estuary seaward of a line drawn through Dunnerholme Point and Greenroad Railway Station

3. In requesting this information the Member also asked for details of the seaward extent of the fishery powers of the Authority. These powers are set out in paragraph 4 of Schedule 2 to the Water Act 1973 as amended by the Fishery Limits Act 1976. They provide that the fisheries area of the Authority includes those tidal waters and parts of the sea adjoining its coast to a distance of 6 nautical miles measured from the base lines from which the breadth of territorial sea is measured.

4. The base lines for measurement are not defined in the 1973 or 1976 Acts. The matter is an exercise for the Royal Prerogative and does not require the authority of an Act of Parliament. The Royal Prerogative is exercised in The Territorial Waters Order in Council 1964. This defines the base line as being the low-water line along the coast.

5. In the case of sea adjacent to a bay, of which the normal entrance point of the bay does not exceed 24 miles, the base line is a straight line joining the low-water line. In the Order the expression "bay" means an indentation of the coast such that its area is not less than that of a semi-circle whose diameter is a line drawn across the mouth of the indentation. The area of indentation is the area bounded by the low-water line around the shore of the indentation. There are further qualifications in calculating area if, because of the presence of islands, the bay has more than one mouth. Accordingly, to establish the seaward boundary of the Authority for the fisheries function low-water lines and the co-ordinates of latitude and longitude will have to be plotted on maps. This is particularly important because a small high speed boat is now to be obtained for use in investigating reports of illegal off-shore netting.

6. Members will be aware that the Lancashire and Western and Cumbria Sea Fisheries Committees have powers in territorial waters, including those within the six nautical mile limit, to regulate (inter alia) sea fishing, shrimp fishing and shell fisheries. Therefore, although there is an overlap of interests there is not an overlap of responsibility in that the Sea Fisheries Committees do not have any responsibilities for controlling the netting of migratory fish except insofar as Sea Fisheries staff may be appoitned Honorary Bailiffs.

NORTH WEST WATER AUTHORITY

LUNE, WYRE AND FURNESS
FISHERIES ADVISORY COMMITTEE

24TH OCTOBER, 1977

FISHERIES IN THE OWNERSHIP OF THE AUTHORITY - DEVELOPMENT OF COARSE ANGLING ON AUTHORITY'S HALTON FISHERY, RIVER LUNE - PROGRESS REPORT

1. This matter was previously reported to the Committee at the meetings held on 5th July, 1976 (Minute No. 30) and 25th October, 1976 (Minute No. 9), the recommendations made at those meetings being dependent upon determination of the Authority's rights (if any) of access to the fishery.

2. At that time, negotiations were about to commence for the acquisition of land by the Authority in the vicinity of Forge Mill Weir, which was required in connection with the intake for the Lancashire Conjunctive Use Scheme. As these negotiations could have affected the position, the question of access to the fishery was deferred.

3. Agreement has however now been reached on the purchase of this land for the purposes of the Conjunctive Use Scheme. The area to be acquired extends approximately 400 yards upstream along the left bank of the river from Forge Mill Weir - that is to say, most of the way up to the railway bridge at Crook O'Lune. Problems of access on this length should therefore be eliminated when the purchase is finally completed.

4. Regarding the remainder of the left bank upstream of that point, and of the right bank from the upstream limit of the fishery near the Hermitage down to the limit of the Authority's ownership of fishing rights at the mouth of Halton Green Beck, it is understood that the Authority's ownership is being disputed over part of this length, and that resolution of the dispute may take some time. Thereafter it should be possible to deal with the question of easements or where necessary the acquisition of land for access from the Caton-Halton road. The Assistant Director, Estates Management is at present investigating this matter.

5. Where riparian owners are prepared to grant easements, the possibility of purchasing access rights 'in perpetuity' by making a capital payment will be considered.

6. Details of further developments will be reported to a future meeting of the Committee.

NORTH WEST WATER AUTHORITY

REGIONAL FISHERIES COMMITTEE

LUNE, WYRE AND FURNESS
FISHERIES ADVISORY COMMITTEE

24TH OCTOBER 1977

EROSION

1. Members of the Committee have, over the years, expressed their concern at continuing erosion of rivers such as the Lune and the effect of such erosion on the fisheries. (A discussion was held at Caton on the occasion of the last Joint Inspection by the Land Drainage and Fisheries Committees). This paper briefly outlines the reasons for erosion, possible remedial or preventative action, and the scale of the problem.

2. Erosion generally occurs when the gradient of the bed of the river is too steep and this has an effect of causing the river to meander, thereby reducing the gradient and increasing the length of the river. The process of erosion can be speeded up by man's interference such as urban development upstream; improved field drainage and the removal of restrictions such as bridges or weirs. Other factors affecting the rate of erosion are the nature of the soil, height of the river bank, and the amount of protection afforded by trees and vegetation.

3. Erosion can be prevented by the introduction of weirs to reduce the velocity or the revetting of the banks to withstand the scouring action of the river or a combination of both. However skillfully and sensitively such works may be fitted into the landscape there is no doubt that opinions would be expressed that they would destroy the attractions of the river. Generally speaking the cost of engineering works to prevent erosion on any extensive scale would greatly exceed the benefits arising. The fact that riparian owners do not themselves, in general, carry out works of this nature indicates that they do not consider that such investment would be worthwhile. In addition the many riparian owners along the reach of a river would have to work in concert if the protection of one part was not to increase the damage at another.

4. One solution to alleviate the effects of erosion, as opposed to trying to prevent it completely, is the construction of short groynes to redirect the flow to where it will do less damage. This should be less costly although it has the same disadvantages in that there is a distinct risk of passing the problem on from one riparian owner to the next. An indication of the order of expenditure involved is given by the fact that the four groynes being constructed for fishery purposes on the length of the Lune between Forge Weir and Lower Halton Weir are estimated to cost £25,000.

5. It is difficult to make an estimate of the total length of river in the region where erosion is actually taking place but it is clear that any attempt by the Authority to assume responsibility for its prevention on a regional basis would be impracticable in terms of the financial and manpower resources presently available.

6. The problem of erosion is a long-standing one and was the subject of discussion in the former River Authorities. Their policies in respect of erosion were reviewed after reorganisation of the Water Industry by the Local Land Drainage Advisory Committees, who decided to leave the situation unchanged. In essence the policy is not to undertake work to arrest natural erosion unless it is affecting the regime of the river or is threatening an embankment or some other work and is likely to cause flooding or adversely affect other land drainage interests. The National Association of Land Drainage Committees, (the membership of which body includes the Chairman of Regional and Local Land Drainage Committees of all Water Authorities), considered a paper on the matter in October, 1975 and the general opinion was voiced that the policies then being followed, should, in view of the extent of the problem and all the factors involved, remain unaltered. It was apparent when this paper was considered that the nationwide view of those concerned with land drainage was not to initiate policy on erosion which would lead to a commitment to massive continuing expenditure.

7. It has been suggested by Members that there might be a possibility of the formation of a Committee of the fishery interests, land owners and Water Authority Officers to discuss the possibility of joint action to investigate the situation on the middle and lower Lune. Such a proposal would require to be discussed in the regional setting and no doubt the views of the Local Land Drainage Committee would need to be sought before submission of any recommendations to the Regional Land Drainage and Fisheries Committees.

Item No. 10

NORTH WEST WATER AUTHORITY

LUNE, WYRE AND FURNESS
FISHERIES ADVISORY COMMITTEE

24TH OCTOBER, 1977

REPORT BY THE AREA FISHERIES OFFICER
ON FISHERIES ACTIVITIES

1. FISHING CONDITIONS

(i) This year, the movement of fish into rivers in this area appears extremely variable. The Kent has had very good runs of both salmon and sea trout and many anglers report the best fishing since 1966. One angler is reported to have caught eight salmon in one evening. A catch of a dozen decent sized sea trout in one night has not been uncommon. Migratory fish have now run right through to the upper reaches.

(ii) After a late start on the Lune, salmon are resonably plentiful, especially in the lower reaches and some good catches have been reported, a couple of 28 lb. fish being the largest. At the beginning of September fish were still passing over Skerton Weir on most tides and good numbers were shoaled in Lansil's water.

(iii) The River Duddon has received fair runs of both salmon and sea trout and good numbers of fish are reported to be still in the estuary.

(iv) The Rivers Crake and Leven have so far shown poor runs of salmon and sea trout but these appear to be improving at the time of writing. In the period 7th-15th September ten salmon were caught on the Leven and nine on the Crake. One possible reason for the poor results on the Leven and Crake may be the fact that no pool has formed at Plumpton viaduct this year and it is possible that fish coming in on the tide have not been able to find a holding place.

(v) The River Keer has had a good run of sea trout with fish up to 7 lb. in weight being caught.

(vi) It appears to have been an average season for brown trout in most rivers, but improved catches have been made in the upper Lune. One stretch on the lower Lune has reported better fishing than for a number of years, with trout of 1-1¾ lb. fairly common, and several 2 lb. fish taken in addition.

(vii) Fishing conditions were generally good at the start of September, but a long dry period in the middle of the month caused the flows in all rivers to fall to lower levels and reduce the success of anglers. At the end of the month heavy rain once more brought all the rivers up, and many anglers were seen on the rivers.

(viii) Large shoals of salmon are reported in the River Lune in the Halton area, and at Arkholme, and fish are still passing over Skerton Weir though in smaller numbers.

(ix) During early spring, numbers of salmon kelts were seen in the River Wyre in the area around St. Michael's - the majority of which were well mended. It is interesting to note that very few fish appeared to be affected by Ulcerative Dermal Necrosis in the River Wyre during the 1976 spawning season and this was obviously reflected in the number of female fish which survived to return to sea. Small shoals of smolts were observed in the St. Michael's area during April.

(x) The first fresh salmon to be observed in the River Wyre this season was seen at Churchtown Weir on 24th April, and some fish were observed in the St. Michael's and Garstang areas during May and June. A few fish were seen in the upper reaches of the river during July and August. Reports of salmon being caught in the lower Wyre in July have not been confirmed. A salmon was caught above Scorton on 8th September followed by two more fish from the Garstang water, these are the only confirmed reports. A salmon was seen in the Abbeystead fish pass during the last week of September.

(xi) The numbers of sea trout which have entered the Wyre system this season are below average. The first fish to be seen were observed at St. Michael's on 13th April but there are no reports of any fish being caught until the second week of September when three fish 1-2 lbs were taken from the Garstang Angling Association water. Two sea trout of about 2 lbs were taken in the River Brock during September. Although sea trout are distributed as far upstream as Abbeystead the total population is very small.

(xii) Trout fishing on the River Wyre followed the usual pattern in that good catches were made by anglers immediately after re-stocking which took place just prior to the season opening or during the fishing season. No notable trout have been reported taken from the river, most fish being in the 10"-11" size range.

(xiii) Angling on the various stillwater trout fisheries in the Wyre catchment appeared to be most productive early and late in the season when some good catches were made. Lower Street Lake produced some good fish up to 2½ lbs. weight. During June and July rainbow trout in Claughton Lake, Barnsfold Reservoir and Wyresdale Park Lake developed a fungal infection and whilst a few fish died there was no significant mortality and the infection appears to have cleared.

(xiv) Very good catches of Chub and Roach have been made in the lower Wyre throughout the year. It is interesting and encouraging to note that after several years of poor roach catches following a pollution and mortality amongst these fish that they are again beginning to form a reasonable proportion of anglers' catches. Considerably more pike than usual were caught in the lower reaches of the River Wyre and one fish of 15½ lbs. was taken from the Churchtown area. On 24th, 25th and 26th June a large shoal of chub was observed in the vicinity of Churchtown weir - probably preparing to spawn. This is the third consecutive year that a collection of these fish has been observed in that area.

2. SALMON DISEASE, ULCERATIVE DERMAL NECROSIS

At the time of writing UDN has not yet developed into a serious problem. The River Kent is, as usual, worst affected with eight dead fish being removed during August. Odd fish with fungus marks have been seen in the Duddon but other rivers are clear.

3. SKERTON WEIR

Since the last report a number of offenders have been apprehended by Police and Bailiffs at Skerton Weir. Two men were caught damaging the sluices in order to take fish, and two men were apprehended twice fixing set lines. Work on the weir is continuing at a very satisfactory rate, and the new fish pass operates very successfully at all flows. The counting installation will, as designed, only be a low flow counter, as at higher flows there is a considerable escapement of fish over the side walls of the fish pass. Considering the difficulties of phasing the work there has been little interruption in the free passage of migratory fish this year.

4. FORGE WEIR FISH COUNTER

At the previous meeting of the Committee it was requested that apparent inaccuracies in the readings of the fish counter should be investigated.

Observations have shown that some fish are still taking the old fish pass in the centre of the weir. A number of fish have been observed this year especially with the high flow conditions which have existed over the last few weeks. Fish counting electrodes were installed across the old fish pass in 1976 but these have not yet been connected up. This work will be carried out as soon as the new instrument room in the pumping station at Halton is completed.

5. POACHING ACTIVITY

This year poaching activity has been very heavy and a large number of poachers have been apprehended. As usual the main areas of activity have been Skerton and Kendal, but two netting gangs have been caught in the Arkholme area of the Lune. One gang was also caught at Middleton. This resulted in five men being fined £150 each. A suspected case of cymag use occurred in the River Crake on 24th August, but unfortunately this could not be confirmed.

6. ASSAULT ON BAILIFF NUTTALL

On 13th July Bailiff Nuttall was assaulted whilst on early morning patrol on the River Duddon. He was taken to hospital at Barrow where he required 21 stitches to be placed in cuts to his face, arm and leg. Bailiff Nuttall was off work for a week with his injuries.

Despite excellent co-operation from the Police the persons who attacked the Bailiff have not been traced.

7. FISH MORTALITIES

A serious fish mortality occurred on the River Crake on 24th August. The fish involved were:-

1	Salmon
239	Sea Trout
33	Salmon Parr
14	Sea Trout Parr
54	Brown Trout

Despite intensive investigations it has proved impossible to positively identify the cause of this mortality. The dead fish exhibited signs of cyanide poisoning but investigations of any poaching attempt using poison have been inconclusive.

On 15th July a number of dead eels and invertebrates were discovered in Whitley Beck, a tributary of the River Conder. Investigations carried out by the River Inspector suggested that a possible discharge from a mushroom farm could have caused contamination of the surface drainage system. The owner has been instructed to install a sealed tank and in addition the surface drainage system is to be re-routed to a soakaway. He has been warned that any discharge will be formally sampled with a view to legal proceedings being considered.

8. FISHERY GROYNES - RIVER LUNE AT HALTON

Construction of the fishery groynes in the Lune near Bambers Nill at Halton is proceeding. The two groynes on the right bank have been completed, but the groynes on the left bank have not been started because of high water conditions.

9. FISH COUNTING STATIONS

Haverthwaite

Month	Fish Under 4 lbs.	Fish Over 4 lbs.
June	18	1
July	207	17
August (up to 27th)	107	3
TOTALS	332	21

Halton

Month	Fish Over 4 lbs.
January	97
February	42
March	12
April	39
May	103
June	168
July	447
August	1,057
TOTAL	1,965

10. MIDDLETON HATCHERY

It was reported to the last meeting of the Committee that whilst the Hatchery was empty, works would be carried out which would have the effect of reducing the silt load entering the Hatchery. This work is about to commence.

11. MIGRATORY FISH PROPAGATION

Since 1963 it has been the practice to introduce 25,000 unfed salmon fry and 25,000 fed salmon fry each season into the River Wyre system.

Although sufficient ova was available it was not possible to introduce salmon fry into the Wyre system during the 1976-77 propagation season, due to heavy mortalities in fry being developed in the Langcliffe Hatchery. There is a considerable history of problems relating to the development of small fish at the hatchery and whilst modifications to the system have been made since last season it is not certain that these will be completely effective. In view of this, arrangements have been made with the Area Fisheries Officer, (North) to develop a suitable number of ova to the fry stage at Middleton Hatchery for implanting in feeder streams of the Wyre. If results achieved during the 1976 season at Langcliffe can be repeated in 1978 then a supply of 2" to 3" parr will be made available from this source in addition to those produced at Middleton.

12. PROPOSED FISH MONITOR - GARSTANG INTAKE

The in-river works associated with the construction of the Lune-Wyre transfer link intake at Garstang have resulted in considerable change of the bed profile in the river immediately downstream of the works. Siting of a mass concrete strip across the river bed which will form the foundation for attachment of fish sensors has had to be delayed and it will not be possible to make a decision as to the most suitable position until work in the river is finished and the bed has developed and settled into a natural regime.

13. STOCKING OF SALMON AND SEA TROUT INTO WATERS WITHIN THE AREA WITHIN THE LAST THREE YEARS

At the last meeting of the Committee details of stocking of salmon and sea trout into waters within the area during the past three years were requested. A summary of this information is set out below. A detailed list of stocking records will be circulated to Members at the meeting.

Kent Watershed

1974	112,000	Eyed sea trout ova	311	Redds made
	32,500	Salmon eyed ova (own stock)	92	Redds made
	60,000	Unfed sea trout fry (own stock)	-	
	8,333	Unfed sea trout fry (Scotch Stock)	-	
	14,000	Fed sea trout fry (own stock)	-	
1975	87,000	Sea trout ova	496	Redds made
	38,320	Salmon ova	92	Redds made
	15,000	Unfed salmon fry (Kashmere boxes)	-	
	10,000	Eyed salmon ova (Scotch stock)	33	Redds made
	40,000	Sea trout ova (Scotch stock)	-	
	50,000	Unfed sea trout fry	-	
	24,000	Fed sea trout fry	-	
1976	46,000	Eyed sea trout ova	139	Redds made
	22,400	Salmon eyed ova	80	Redds made
	75,000	Unfed sea trout fry	-	
	20,000	Unfed sea trout fry (own stock)	-	
	3,900	Fed sea trout fry (own stock)	-	
	5,000	Fed salmon fry (own stock)	-	

Leven Watershed

1974	42,000	Eyed sea trout ova	74	Redds made
	24,000	Unfed sea trout fry (own stock)	-	
	23,000	Fed sea trout fry (own stock)	-	
1975	30,000	Sea trout ova	60	Redds made
	5,000	Unfed salmon fry (from boxes)	-	
	20,000	Unfed sea trout fry	-	
	21,000	Fed sea trout fry	-	
1976	20,000	Eyed sea trout ova	60	Redds made
	10,000	Unfed sea trout fry (own stock)	-	
	32,000	Fed sea trout fry (own stock)	-	
	5,000	Fed salmon fry (own stock)	-	

Crake Watershed

1974	10,000	Eyed sea trout ova	27	Redds made
	10,000	Fed sea trout fry (own stock)	-	
1975	22,000	Unfed sea trout fry	-	
1976	14,000	Eyed sea trout ova	31	Redds made
	8,000	Unfed sea trout fry (own stock)		

Duddon Watershed

1974	18,000	Eyed sea trout ova	54	Redds made
	25,000	Unfed sea trout fry (Scotch stock)	-	
	11,000	Fed sea trout fry (own stock)	-	
1975	20,600	Sea trout ova	45	Redds made
	23,000	Unfed sea trout fry	-	
	12,000	Fed sea trout fry	-	
1976	20,000	Eyed sea trout ova	62	Redds made
	10,000	Unfed sea trout fry (own stock)	-	

Keer Watershed

1974	15,000	Unfed sea trout fry (own stock)	-
	12,000	Fed sea trout fry (own stock)	-
1975	5,000	Unfed sea trout fry	-
	13,000	Fed sea trout fry	-
1976	15,000	Fed sea trout fry	-

Wyre Watershed

1976	25,000	Unfed salmon fry	-

Lune Watershed

1975	120,000	Fed salmon fry	-
	138,565	Salmon eyed ova	-
	149,000	Unfed salmon fry	-
1976	155,000	Unfed salmon fry	-
	124,750	Salmon eyed ova	-
	135,000	Salmon fed fry	-

Lakes Windermre, Esthwaite and Grasmere Watersheds

Surplus brown trout ova and unfed fry from Freshwater Biological Association

1975	72,000	Unfed fry
	9,000	Eyed ova